ELECTROSTATIC VALVES FOR MICROFLUIDIC DEVICES

ABSTRACT OF THE DISCLOSURE

Valve structures formed in elastomer material are electrostatically actuated by applying voltage to a flexible, electrically conductive wire pattern. An actuation force generated between the patterned wire structure and an electrode result in closure of a flow channel formed in elastomer material underlying the wire. In one embodiment of a valve structure in accordance with the present invention, the wire structure is patterned by lithography and etching of a copper/polyimide laminate, with an underlying gold plate positioned on the opposite side of the flow channel serving as an electrode. In an alternative embodiment, a first wire structure is patterned by physically cutting out a first pattern of strips from an Aluminum/Mylar laminate sheet. A second patterned wire structure serving as the electrode is formed by the same method, and positioned on the opposite side of a control channel. Application of an actuation force between the first and second patterned strips closes the control channel and an associated flow channel underlying the control channel.

PA 3112922 v1